Lure of the Void

Nick Land

> . . . the idea that we are no longer able to accomplish feats we once could do (like travel to the Moon) clashes with the **prevailing narrative** that we march forever forward. Not only can't we get to the Moon at present, but the U.S. no longer has a space shuttle program — originally envisioned to make space travel as routine as air travel. And for that matter, I no longer have the option to purchase a ticket to fly trans-Atlantic at supersonic speeds on the Concorde. Narratives can break.[1]
>
> —Tom Murphy (bolding in original)

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Shanghai's 2010 World Expo included an entire pavilion dedicated to urban futures. Among the exhibits was a looping video on a large screen, depicting varieties of futuristic city-types as speculative animations, light-heartedly, and with obvious orientation to youngsters. Since children are the denizens of the future, it makes sense to treat them as the target audience for a vision of tomorrow's world, but the effect was also disconcerting, as if parenthesizing what was shown in a form of deniable, non-abrasive irony. *This is what the future used to look like*. Does it still? On this point, a subtle reserve concealed itself as a concession to childish credibility, or even inconsequential fantasy.

One of the four future cities on display had been constructed off-planet, in earth-orbit. It was populated by happy humans (or, at least, humanoids). No date was predicted. Untethered from firm futuristic commitment, it intersected adult perception as a fragment of cross-cultural memory.

"Imagine a city in space, as a child might." Given the strategic obscurity of this statement, when encountered at a carefully-crafted international event, in a sophisticated, cosmopolitan, global, Chinese city, in 2010, it is tempting to approach it through analogy. Half a century ago, when Western children were encouraged to imagine such things, during the twilight decades of modernity (1.0), was a sincere promise being made to them that they would inherit the solar system? If so, is such a promise now being humorously referenced, or is it being re-directed, and re-made?

The 2010 Expo had a Space Pavilion, too, which only deepened the perplexity. Given the opportunity to re-activate Expo traditions of techno-industrial grandiosity, it was a spectacular miss-launch, containing almost nothing in the way of monumental hardware. The content fell into two broad categories: video-based immersive special effects (highly-appreciated by kids), and vanilla-domestic applications of space technology, on the approximate model of NASA's lamentable "we're the guys who brought you the non-stick frying-pan" PR campaign. Anybody hoping for soul-crushing cyclopean military-analog launch vehicles and the acrid stink of rocket fuel had clearly wandered into the wrong century. Contemporary international etiquette prevailed, and according to that, the business of blazing into orbit is far too crude—even primitive—to be vigorously publicized.

[1] Tom Murphy, "Why Not Space?" http://physics.ucsd.edu/do-the-math/2011/10/why-not-space/

So even in China, at least in its 2010 window to the world, off-planet aspirations were stirred together indissolubly with childhood fantasy. The unmistakable insinuation, harmonized with the commanding heights of world opinion, was that such hard SF dreams had been outgrown. Rather than staring through a window into the spark-torched clangorous workshop of China's emerging national space program, Western visitors found their gazes bounced from mirrored glass, into a 'postmodern' vacuum of collapsed expectations, amongst the eroded ruins of Apollo. Four decades of Occidental space failure smiled politely back. *You lost it, didn't you?* (A quick trip across the Huangpu to the drearily mundane USA Pavilion sufficed for unambiguous confirmation.)

The dismissal of a human off-planet future as a childish dream has plenty to build upon. The world's publishers and book shops have long accommodated their classification systems to the sleazy ambiguity of the 'science fiction / fantasy genre', in which futurism smears into oneirism, and the vestiges of hard SF programs (telecommunication satellites, moon bases, space elevators . . .) are scattered amongst fantastic elves-in-space mythologies (from *Star Wars* to *Avatar*). Competitive prophecies decay into polemical allegories, making statements about anything and everything except the shape of the future.

Of all the cultural ripples from the truncation of the Apollo-era space trajectory, none is more telling than the rising popularity of 'Moon Hoax' conspiracy theorizing. Not satisfied with the prospective evacuation of the heavens, the moon hoaxers began systematically editing space-travelers out of the past, beginning with the lunar landings. Whilst clearly maddening to space technologists, American patriots, NASA supporters, and sensible types in general, this form of 'denialism' is not only historically comprehensible, but even inevitable. If nobody seriously contests the fact that Columbus reached the New World, it is at least in part because what was then started kept happening. Something began, and continued. Nothing comparable can be said about the process of lunar colonization, and that, in itself, is a provocative oddity. When forecasts are remembered, abandoned outcomes can be expected to mess up memories.

Old-school space enthusiast Sylvia Engdahl finds the whole situation pathological, and subjects it to a kind of jerry-built psychoanalysis. With defiant optimism, she attributes "the present hiatus in space travel" to xenophobic trauma:

> *Much is said about the positive effect of the photos of Earth obtained by Apollo 8, which for the first time showed our planet as a globe, a fragile refuge amid barren surroundings, and thereby launched the environmental movement. The concomitant negative impact—the spread of gut-level knowledge that space is an actual place containing little that's familiar to us and perhaps much that we'd rather not meet—is not spoken of. But it may be no less significant. Could this be one of the reasons why interest in space died so soon after the first Moon landing, resulting in the cancellation of the last few planned Apollo missions?* [2]

She elaborates:

> *Most people do not want to contemplate the significance of an open universe. They do not let uneasiness about it into their minds, but underneath, as the collective unconscious of humankind absorbs the knowledge, they grasp it, and react with dismay disguised as apathy. It does not occur to them that they might be disturbed by the prospect of space exploration. Rather, they believe that although in theory they want humankind to reach new worlds, it's of low priority*

[2] Sylvia Engdahl, "Confronting the Universe in the 21st Century."

> *compared to the problems of here and now . . . [T]he widespread conviction that the public no longer cares about space may also be a rationalization.*

Engdahl hints at a modern variant of the Orpheus myth, and captures something of arresting significance. We were told not to look back from orbit, but of course, we did, and what we saw pulled us back down. The damnation of our extraterrestrial out-leap gave birth to a lucid environmentalist vision—the earth seen from space. That is why physics professor Tom Murphy turns to the Grand Archdruid of the Ancient Order of Druids in America, John Michael Greer, to transmute elegiac disillusionment into acceptance:

> *The orbiters are silent now, waiting for the last awkward journey that will take them to the museums that will warehouse the grandest of our civilization's failed dreams. There will be no countdown, no pillar of flame to punch them through the atmosphere and send them whipping around the planet at orbital speeds. All of that is over. … In the final analysis, space travel was simply the furthest and most characteristic offshoot of industrial civilization, and depended — as all of industrial civilization depends — on vast quantities of cheap, highly concentrated, readily accessible energy. That basic condition is coming to an end around us right now.*[3]

Disillusionment is simply awakening from childish things, the druids tell us. This is a point Murphy is keen to endorse: "space fantasies can prevent us from tackling mundane problems." Intriguingly, his initial step towards acceptance involves a rectification of false memory, through a (sane) analog of 'Moon Hoax' denial. Surveying his students on their understanding of recent space history ("since 1980 or so"), he discovered that no less than 52% thought humans had departed the earth as far as the moon in that time (385,000 km distant). Only 11% correctly understood that no manned expedition had escaped Low Earth Orbit (LEO) since the end of the Apollo program (600 km out). Recent human space activity, at least in the way it was imagined, had not taken place. It was predominantly a collective hallucination.

Murphy's highly-developed style of numerate druidism represents the null hypothesis in the space settlement debate: perhaps we're not out there because there's no convincing reason to expect anything else. Extraterrestrial space isn't a frontier, even a tough one, but rather an implacably hostile desolation that promises nothing except grief and waste. There's some scientific data to be gleaned, and also (although Murphy doesn't emphasize this) opportunities for political theatrics. Other than that, however, there's nothing beyond LEO worth reaching for.

The neo-druidic starting point is unapologetically down to earth. It begins with energy physics, and the remorseless fact that doing just about anything heats things up. According to Murphy's calculations,[4] a modest 2.3% global economic growth rate suffices to bring the planetary surface to the boiling point of water within four centuries, even in the complete absence of (positive) greenhouse effects. Economic growth is essentially exponential, and that guarantees that we're cooked, due to elementary thermodynamic principles, efficiency limits, and the geophysics of heat dissipation. Within this big

[3] John Michael Greer, "An Elegy for the Age of Space." http://thearchdruidreport.blogspot.com/2011/08/elegy-for-age-of-space.html

[4] Tom Murphy, "Can Economic Growth Last?" http://physics.ucsd.edu/do-the-math/2011/07/can-economic-growth-last/

picture, conventional 'energy crisis' concerns are no more than complicating details, although Murphy engages them thoroughly.[5]

From the neo-druidic perspective, the space 'frontier' is a horizon of sheer escapism, attracting those who stubbornly deny the necessity of limitation (pestilential growth-addicts):

> *. . . relying on space to provide an infinite resource base into which we grow/expand forever is misguided. Not only is it much harder than many people appreciate, but it represents a distraction to the message that growth cannot continue on Earth and we should get busy planning a transition to a non-growth-based, truly sustainable existence.*

Since plenty of irrepressible growth-mongers seriously want to get out there, Murphy trowels on the discouragement in thick, viscous layers. Most of the deterrent factors are relatively familiar, but none of them are frivolous, or easily dismissed. The principal problem is the most qualitative (and druidic): human adaptation to terrestrial conditions. This is strikingly illuminated by a consideration of terrestrial 'frontier' environments that remain almost entirely unexploited, despite environmental features that are overwhelmingly more benign than anything to be found off-planet. When compared to any conceivable space station, asteroid mining camp, lunar base, or Mars colony, even the most 'difficult' places on earth—the seabed, for instance, or the Antarctic—are characterized by extreme hospitability, with ready access to breathable air, nutrients, fuels, and other essential resources, a moderate temperature range, protection from cosmic radiation, and proximity to existing human settlements. This is to be contrasted with typical extraterrestrial conditions of hard vacuum, utter exposure, complete absence of bio-compatible chemistry, and mind-jarring distances.

Murphy touched upon these distances in his survey of student space ignorance. If earth is represented by a "standard" 30-centimeter globe, LEO is 1.5 centimeters from the surface, and the moon a full 9 meters further out. For intuitive purchase upon more expansive space visions, however, a re-calibration is required.

It makes sense to model the earth as a small apple (8.5 cm in diameter), because then an astronomical unit (AU, the mean earth-sun distance of roughly 150 million kilometers, 93 million miles, or 500 light seconds) shrinks to a kilometer, with the sun represented by a sphere a little over 10 meters in diameter. The moon now lies less than 2.7 meters out from our toy earth, but Mars is never less than 400 meters away, the nearest asteroids a kilometer away. The distance to the edge of the planetary solar system (Neptune) is at least 29 kilometers, and within this spatial volume (a sphere of roughly 113,400 AU3), less than one part in 27 billion is anything other than desolate vacuum, with almost all the rest being solar furnace. On the toy scale, the outer edge of the solar system, and the Oort cloud, lies 50,000 kilometers from the earth. The distance from our shriveled apple to the nearest star, Proxima Centauri, is 277,600 toy kilometers (or 41.5 trillion real ones).

If space colonization is being construed as an escape from terrestrial resource constraints, then a pattern of activity needs to be knitted across these distances, producing—at a minimum—an energy surplus. In a non-frictional kinetic system, governed almost purely by (macroscopic) conservation of momentum, the basic currency of space activity is 'delta-v', or the transformation of velocity. Delta-v is broadly proportional to energy expenditure on "small burns", when fuel consumption makes a negligible

[5] C.f., Tom Murphy, "My Great Hope for the Future." http://physics.ucsd.edu/do-the-math/2012/02/my-great-hope-for-the-future/

difference to total propelled mass, but when complete flights or "large burns" are calculated, the math becomes nonlinear, since the reduction of fuel payload becomes a critical factor in the equation (subtracting inertial resistance as it adds motive force). In practical terms, the prospective off-planet ('space-faring') energy economy consists of the consumption of propellant to move propellant about, with non-fuel vehicle mass contributing little more than a rounding error in the calculations.

> *Somewhat counter-intuitively, it is possible to get the rocket moving faster than the exhaust velocity once the fuel mass exceeds 63% of the total initial mass. In order to get delta-v values in the 20 km/s range when the exhaust velocity is less than 5 km/s requires almost nothing but fuel. . . . [T]he large delta-v's required to get around the solar system require a lot of fuel . . .*[6]

This double-registry of fuel within the nonlinear equations of "rocket math"—as payload and propellant—is the key to Murphy's deep skepticism about the viability of off-planet energy economics. The fuel resources strewn within the inner solar system—even assuming their absolute abundance—cannot be moved around usefully for less energy than they provide. Jupiter offers the most tantalizing example. This methane-rich gas giant might be superficially apprehended as an immense cosmic fuel depot, but even the most generous calculations of delta-v requirements for a Jupiter 'tanker-run' imply energy expenditures at least an order of magnitude higher than energy obtained—from the 'scooping' operation alone. The inner solar-system is abundant in "stranded resources" that cannot conceivably be extracted at a cost lower than their value. That, at least, is the coherent neo-druidic perspective.

. . . and yet, in the yawning void, where the space settlements were meant to have been, the stirrings have not ceased. There even seems to be, unmistakably, a quickening of pace. Chinese 'Taikonauts'[7], private (American) 'NewSpace' businesses, and ever more advanced robots are venturing out beyond the wreckage of dead dreams. Are they heading anywhere that works, or that even makes sense?

[6] Tom Murphy, "Stranded Resources." http://physics.ucsd.edu/do-the-math/2012/02/my-great-hope-for-the-future/

[7] Craig Covault, "First Look: China's Big New Rockets." *America Space*. 18 July 2012.

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> . . . it's important to understand what Apollo was, and wasn't. It was a victory in the Cold War over the Soviets, but because we were at war, we waged it with a state socialist enterprise. What it was not was the first step of opening up the frontier to humanity, and it was in fact a false start that has created a template for NASA and a groove in which we've been stuck for over four decades now, with many billions spent and little useful progress.[8]
>
> —Rand Simberg

> The opening of the American west in the first decades of the 19th century and the opening of the space frontier in these first decades of the 21st century are very similar.[9]
>
> —Mike Snead

Fascism makes our heads spin, which is unfortunate, because an inability to gaze unwaveringly into the dominant 'third way' model of political economy (corporate nationalism) makes the history of the last century unintelligible. For amateur space historians, dropping in briefly on the Moon Nazis is simply unavoidable.

SS Sturmbannführer Wernher von Braun, Deputy Associate Administrator for Planning at NASA Headquarters, Washington DC (1970-2), helps with the introduction. Technical director of the Nazi rocket program at Peenemünde, which culminated in the creation of the A-4 (V-2) ballistic missile, von Braun was brought to America in 1945 as the top prize of Operation Paperclip. His contribution to US rocket development, through Redstone to Apollo (and the moon), was central and indispensable. NASA Socialism was born on the Dark Side of the Moon.[10]

If fascism sounds unduly harsh, more comfortable terminology lies within easy reach. 'Technocracy' will do fine. The name is less important than the essentials, which were already clearly formulated in the work of a previous German immigrant to the United States, Friedrich List, who devoted an influential book to outlining *The National System of Political Economy* (1841). According to List, the 'cosmopolitanism' of mainstream (Smithean) political economy was insufficiently attentive to the collective national interest. Industrial development was too important to be surrendered to the interplay of private economic agents, and should instead be considered a strategic imperative, within the context of international competition. Only by leveraging the power of the state to regulate trade, foster modern industries, and drive the development of critical infrastructure, could a country hope to advance its interests in the international arena. Development was war by other means, and sometimes the same ones.

When eagerly embraced by Henry Clay, who connected List's ideas with the founding tradition from Alexander Hamilton, these ideas became the basis of the American System. Economic nationalism was

[8] Rand Simberg, "Towards a Conservative Space Policy." *National Review*. 1 February 2010.
[9] Mike Snead, "How America Can and Why America Must Now Become a True Spacefearing Nation." http://spacefaringamerica.net/2007/10/11/16--the-space-show-appearance-talking-points.aspx/
[10] C.f., Wayne Biddle, "Dark Side of the Moon: Wernher Von Braun, the Third Reich, and the Space Race."

to be pursued along the threefold path of managed trade (tariffs), state-controlled finance (central banking), and state-directed infrastructure development (especially transportation systems). Such policies were already 'progressive' or fascist technocratic in that they subordinated private-cosmopolitan economic interests to national purposes, but this took place flexibly, without the more recent encrustations of anti-business class warfare, large-scale entitlement spending, or Cathedralist cultural policing. Capitalism was to be steered, and even promoted, rather than milked, deliberately ruined, or replaced. Due to its patriotic direction, elitism, and affinity with militarization, this technocratic progressivism could easily be understood as a phenomenon of 'the right', or at least (in Walter Russell Mead's words) the "Bipartisan Establishment."[11]

Apollo perfectly exemplified American technocratic progressivism in the Teutonized, neo-Hamiltonian tradition. A small step for a man, and a substantial leap for mankind, it was a colossal high-jump for the US Leviathan, marking an unambiguous triumph in the structured competition with its principal geo-strategic and ideological rival. The Apollo program wasn't *exactly* part of the ballistic missile arms race with the Soviet Union, but it was close enough to contribute to its symbolic, mass-psychological, and deterrent purpose. Landing a man on the moon was a type of overkill, relative to landing a nuke on Moscow, and it expressed a super-abundant payload-delivery capability that had won a war of messages.

In an article originally published in *The American Spectator* (November 10, 2010), Iain Murray and Rand Simberg describe the moon race as Big Government's Final Frontier, remarking that:

> *There's something about space policy that makes conservatives forget their principles. Just one mention of NASA, and conservatives are quite happy to check their small-government instincts at the door and vote in favor of massive government programs and harsh regulations that stifle private enterprise.*[12]

They conclude:

> *It is time for conservatives to recognize that Apollo is over. We must recognize that Apollo was a centrally planned monopolistic government program for a few government employees, in the service of Cold War propaganda and was therefore itself an affront to American values. If we want to seriously explore, and potentially exploit space, we need to harness private enterprise, and push the technologies really needed to do so.*

Whilst it would be pointlessly upsetting to translate this into a call for the denazification of outer space, it would be equally misleading to read it as nothing of the kind. Progressive technocracy, in a range of national flavors, is the only effective space politics the world has ever seen, and it is still far more likely—in the near-term—to be modernized than radically supplanted. Space development poses such an immense collective challenge that it sucks even liberty-oriented conservatives such as Simberg towards accommodation with the activist, catalytic, neo-Hamiltonian state. At least initially, there's simply no other place where the clanking machinery of Leviathan is more at home.

[11] Walter Russell Mead, "The Age of Hamilton." *The American Interest*. 6 December 2011.
[12] Iain Murray and Rand Simberg, "Big Government's Final Frontier." *Competitive Enterprise Institute*. 10 November 2010.

Popular culture has picked up on this well. Among the many reasons for the ecstatic reception to Ridley Scott's *Alien* (1979) was appreciation for its 'realistic' tonal portrait of practical space activity. Science and commerce played their parts, but the leading edge was dominated by quasi-military heavy metal, funded by massive budgets based on gravely obscure strategic objectives, directed and crewed by hard, obedient, buzz-cut types who did whatever it took to get things done. Weapons research trumped all other considerations. Breaking out into the deep frontier required a rigid, armored-bulkhead seriousness that civilians would never quite understand.

When suddenly stripped of its Cold War context, the proxy warfaring of the rocket-state lost coherent motivation, and immediately veered off course into increasingly ludicrous pseudo-objectives. By the closing years of the 20th century, all pretense of a big push outwards had been dissipated amongst commoditized LEO satellite maintenance, unconvincing zero-gravity science projects, ritualistic space-station diplomacy, multicultural astronaut PR, and even cynical make-work schemes for dangerously competent ex-Soviet technicians. Clever science continued, based on robot probes and space telescopes, but none of that even hinted at an impetus towards space settlement, or even manned spacecraft, and typically advised explicitly against it. Despite all the very real 'right stuff' heroism, putting people in space was a circus act, and perhaps it always had been.

Whatever else outer space may be, it's a place where the right goes schizoid, and the more that it's thought about, the more jagged the split. The seemingly straightforward, dynamic-traditional, and extremely stimulating 'image' of the *frontier* illuminates the point. The frontier is a space of attenuated formal authority, where entrepreneurial, 'bottom-up' processes of social formation and economic endeavor are cultivated amongst archetypal 'rugged individualists', its affinity with libertarian impulses so tight that it establishes the ('homesteading') model of natural property rights, and yet, equally undeniably, it is a zone of savage, informal warfare, broken open as a policy decision, pacified through the unremitting application of force, and developed as a strategic imperative, in the interest of territorial-political integration. By fleeing the state, in the direction of the frontier, the settler or colonist extends the reach of the state towards the frontier, drawing it outwards, and enhancing its ferocity, or *roughening* it. The path of anti-governmental flight confuses itself with a corresponding expansion, hardening, and re-feralization of the state, as the cavalry learn from the Indians, in a place without rules. Then the railroad comes. *The Moon Is a Harsh Mistress* meets *Starship Troopers*.

"A strategy for achieving economic benefit from space must involve both government and industry, as did the development of the American West," argues Martin Elvis.[13] No one seriously disagrees. Whenever realism is prioritized on the extraterrestrial horizon, some variant of rough-and-dirty technocratic progressivism always waits on the launch-pad, ready to piggy-back business off-planet on patriotic, Leviathan-funded, first-stage boosters. ~~Over-hasty denazification is strictly for earth-bound softies~~ The neo-Hamiltonian jump-leads work too well to drop. As usual, Simberg expresses this best:

> *The United States should become a spacefaring nation, and the leader of a spacefaring civilization.*
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> *That means that access to space should be almost as routine (if not quite as affordable) as access to the oceans, and with similar laws and regulations. It means thousands, or millions, of people in space — and not just handpicked government employees, but private citizens spending their own money for their own purposes. It means that we should have the capability to detect*

[13] Martin Elvis, "After Apollo." http://hir.harvard.edu/a-new-empire/after-apollo

> *an asteroid or comet heading for Earth and to deflect it in a timely manner. Similarly it means we should be able to mine asteroids or comets for their resources, for use in space or on Earth, potentially opening up new wealth for the planet. It means that we should explore the solar system the way we did the West: not by sending off small teams of government explorers — Lewis and Clark were the extreme exception, not the rule — but by having lots of people wandering around and peering over the next rill in search of adventure or profit*.
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> *We should have massively parallel exploration—and not just exploration, but development, as it has worked on every previous frontier.*[14]

Which brings us to 'NewSpace' . . .

[14] Rand Simberg, "A Space Program for the Rest of Us." *The New Atlantis, 25*, Summer 2009.

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> There are two related questions posed by human exploration. First, is there anything economically useful to do out there, that pays your way? And second, can you live off the land, and use local resources to survive, or will we always be tied to support from earth? If the answer to both is yes, then you get space colonies, self-sustainable life off-planet. If the answer to both is no, then space is like Mt. Everest. Tourists might go to Mt. Everest, sherpas might make a living off of it, but no one really lives there.
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> If the answer is that you can live off the land, but it's not economically useful, it's like Antarctica. It was 40 years between the last time we were there, when Shackleton reached Antarctica, and when the U.S. Navy went back in 1912. There's a similar lapse between going to the Moon the first time and, hopefully, when we'll return. In that case, you can form an outpost and live there, but you're sustained by constant funding, since engineering doesn't pay for itself. If the answer is that there are economically useful things to do, such as mining Helium-3 on the Moon, but we're always reliant on Earth for basic necessities, then space becomes a North Sea oil platform. You can make money there, but it will always be a hostile environment.
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> These are four very radically different human futures. And they're all part of a larger question: Is there a human future beyond Earth? It's a question ranks up there with whether there's intelligent life elsewhere in the universe. We can search for life with probes and telescopes, but to determine the living range of humanity, we're going to have to send humans into space.[15]
>
> —Scott Pace

The material base for a space-faring future is not only stranded in space, but also stranded in time. Not only are the gravitationally-unlocked resources from which it would assemble itself strewn across intimidating immensities of vacant distance, but the threshold where it all begins to come together—in an autocatalytic extraterrestrial economy—is separated from the world of present, practical incentives by dread gulfs of incalculable loss. In a variant of the old joke, if getting off-planet is the goal, a planet is the absolutely worst place to set out from. “I can tell you how to get there,” the local helpfully remarked. “But you shouldn’t start from here.”

Being out there could quickly start to make sense, as long as we were already there. Experimenting with this perspective-switch makes the animating impulse clearer. Most tellingly, it exposes how deeply planets suck, so that merely not being on one is worth almost anything. That’s the end game, the final strategy, ultimately arranging everything, with anti-gravity as the key.

Once gravity is perceived as the natural archetype of imprisonment, keeping you somewhere, whether you want to be there or not, the terrestrial-economic motivations for off-planet expansion are revealed

[15] Scott Pace in “8 Experts Weigh in on the Future of Human Spaceflight.” *Popular Mechanics.* 11 October 2009.

in their fundamental spuriousness. The reason to be in space is to be in space, freed from planetary suckitude, and any benefits to Earth-dwellers that accrue on the way are mere stepping stones. Off-planet resources diverted to the surface of the Earth are, in the ultimate spacer scheme, wasted, or at least strategically sacrificed (since such wastage is almost certainly required in the interim). In the final analysis, the value of anything whatsoever is degraded in direct proportion to the gravitational influences brought to bear upon it, and descent from the heavens is a fall.

A wider cosmo-developmental view sharpens resolution. Smear into fast-forward until the process of extraterrestrial escape has been substantially accomplished, then freeze the screens. Fleeing gravity can now be seen as no more than the first step in a more thorough, antagonistic contestation with gravity and its works. Asteroids and comets are being pulverized, quarried, or bored into sponges, leaving moons, planets, and the sun itself as the local problems of interest. Such bodies are 'problems' because they deform space with gravity wells, which trap resources, but their status as development obstacles can be abstracted further. These worlds, at least partially isolated from the emerging deep-space *commercium* by their own mass, have been shaped by gravity into approximate spheres, which is to say—from the developmental perspective—into the very worst shapes that are mathematically *possible*, since they minimize the ratio of (reactive) surface to volume, and thus restrict resource accessibility to the greatest conceivable extent. Way out there, in deep space and the deep future, the gathering developmental impulse is to go full Vogon, and demolish them completely.

When seen from outside, planets are burial sites, where precious minerals are interred. By digging through the earth's mantle, for instance, all the way down to its interior end, 3,000km beneath the surface, one reaches a high-pressure iron-nickel deposit over 6,500km in diameter—a planet-vaulted metal globe roughly 160,000,000,000 cubic kilometers in size, doped by enough gold and platinum to coat the entire surface of the earth to a depth of half a meter. To a moderately advanced off-world civilization, pondering the practicalities of its first planet-scale demolition, leaving this buried resource trove in place has a robotic-industrial opportunity cost that can be conservatively estimated in the region of 1.6 x 10^23 human-level intelligences, a mineral stockpile sufficient to manufacture a trillion sentient self-replicating probes for every star in the galaxy. (Even ardent conservationists have to recognize how tasty this morsel will look.)

Lift-off, then, is merely a precursor to the first serious plateau of anti-gravity technology, which is oriented towards the more profoundly productive task of *pulling things apart*, in order to convert comparatively inert mass-spheres into volatile clouds of cultural substance. Assuming a fusion-phase energy infrastructure, this initial stage of off-world development culminates in the dismantling of the sun, terminating the absurdly wasteful main-sequence nuclear process, salvaging its fuel reserves, and thus making the awakened solar-system's contribution to the techno-industrial darkening of the galaxy. (Quit squandering hydrogen, and the lights dim.)

Focus for a few seconds on the economic irritability that arises at the sight of an oil-well flaring off natural gas, through sheer mindless incompetence, then glance at the sun. 'Unsustainable' doesn't begin to capture it. Clearly, this energy machinery is utterly demented, amounting to an Azathothic orgy of spilled photons. The entire apparatus needs to be taken apart, through extreme solar surgery. Since this project has yet to receive sustained consideration, however, the specific engineering details can be safely bracketed for now.

The inexorable logic of techno-industrial efficiency, on its anti-gravity vector, means that *the only consistent motivation for leaving the earth is to dismantle the sun* (along with the rest of the solar-

system), but that doesn't play well in Peoria. Unsurprisingly, therefore, those sensitized to political realities, media perceptions, and public relations are inclined to emphasize other things, depicting the earth as a destination for cosmic bounty or—even more immediately—for juicy tax-funded pork,[16] rather than as a tricky but highly-rewarding demolition problem.

Conspicuously missing from the public space debate, therefore, is any frank admission that, "(let's face it folks)—planets are misallocations of matter which don't really work. No one wants to tell you that, but it's true. You know that we deeply respect the green movement, but when we get out there onto the main highway of solar-system redevelopment, and certain very rigid, very extreme environmentalist attitudes—Gaian survivalism, terrestrial holism, planetary preservationism, that sort of thing—are blocking the way forward, well, let me be very clear about this, that means jobs not being created, businesses not being built, factories closing down in the asteroid belt, growth foregone. Keeping the earth together means dollars down the drain—a lot of dollars, *your* dollars. There are people, sincere people, good people, who strongly oppose our plans to deliberately disintegrate the earth. I understand that, really I do, you know—honestly—I used to feel that way myself, not so long ago. I, too, wanted to believe that it was possible to leave this world in one piece, just as it has been for four billion years now. I, too, thought the old ways were probably best, that this planet was the place we belonged, that we should—and could—still find some alternative to pulling it apart. I remember those dreams, really I do, and I still hold them close to my heart. But, people, they were just dreams, old and noble dreams, but dreams, and today I'm here to tell you that we have to wake up. Planets aren't our friends. They're speed-bumps on the road to the future, and we simply can't afford them anymore. Let's back them up digitally, with respect, yes, even with love, and then let's get to work …" [Thunderous applause]

Since, during the present stage of extraterrestrial ambition, pandering to the partisans of cosmic disintegrationism cannot reasonably be conceived as a sure-fire election winner, it is only to be expected that rhetoric of this kind has been muted. Yet, in the absence of some such vision, or consistently extrapolated alignment with anti-gravity, the off-planet impulse is condemned to arbitrariness, insubstantiality, and insincerity of expression. Absent an uncompromised sense of something else, why not stick to this? The result has been, perhaps predictably, a reign of near-silence on the topic of extraterrestrial projects, even in regard to its most limited, immediate, and practically unobjectionable varieties.[17]

If escaping the earth—and gravitational confinement in general—is not an intelligible end, but only a means, what provides the motivation? It is into this cramped, awkwardly-deformed crevice of aspiration that NewSpace must insinuate itself. To speak of 'insincerity' might seem unduly harsh—since there is no reason to suspect conscious deception, or even carefully-calibrated reservation, when NewSpace advocates outline their plans. An enveloping structure of implausibility nevertheless announces itself in every project that is advanced, manifested through the incommensurability between the scale of the undertaking and the rewards that supposedly incentivize it. Space tourism, asteroid mining, micro-gravity experimentation and manufacturing . . . really? Is it genuinely imaginable that these paltry goals finally or sufficiently motivate a prolonged struggle against the terrestrial gravity-trap, rather than serving as fragile *pretexts* or *rationalizations* for the pursuit of far more compelling, yet hazy, unarticulated, or even completely unsuspected objectives?

[16] C.f., "Time to End . . ." http://www.space-travel.com/reports/Time_To_End_Pork_Barrel_Monster_Rocket_And_Expensive_Russian_Space_Ferry_999.html

[17] C.f., Andrew Moseman, "Why Won't the Political Parties Talk about Space?" *Popular Mechanics*. 12 September 2012.

When this question is extended backwards, and outwards, it gathers force. Stretch it back to the moon, and out to Mars, and the inference becomes increasingly irresistible. None of these 'missions' made, or make, any sense whatsoever, except insofar as they abbreviate some wider, undisclosed impulse. Space activity is not the means to a targeted end, but the end to be advanced by a sequence of missions, whose specific content is therefore derivative, and devoid of intrinsic significance. Once the inarticulate outward momentum decays, leaving nothing but an arbitrary extraterrestrial destination to represent it, the naked absurdity that is exposed rapidly extinguishes the last, flickering embers of popular motivation. Four decades of explicit lunar nihilism attest abundantly to that.

Whilst the partial privatization of space activity ('NewSpace') creatively displaces the problem of purpose, it does not radically dispel it. To some degree, NewSpace substitutes the economic motivations of disparate private operators for the political justification of a concentrated public bureaucracy, and by doing so it relieves the pressure to maintain coherent, communicable, and consensual objectives. Space ambitions are freed to enter the fragmented, competitive terrain of idiosyncrasy, variety, experimentation, and even personally-financed frivolity. It might even be thought that seriousness becomes optional.

When examined more doggedly, however, it is clear that the basic problem persists. The terrestrial gravity-well produces a split between the surface of the earth, and 'orbit' (or beyond), and private capital is no less severely divided by this schism than Rocket-State 'public' hardware. Whilst convertible temporarily into forms of inert, stored value, capital is an essentially modern phenomenon, born in industrial revolution, and typically defined by the diversion of immediate consumption into 'roundabout' production, which is to say: machinery. It is reproduced, or accumulated, by circulating through machines, or apparatus, and it is upon this that the gravity-well compels a decision: is NewSpace capital to be invested, unambiguously, *in space*?

A serious space program is, fundamentally and irreducibly, a process or terrestrial evacuation. It requires the consistent relocation (or de-location) of enterprise, resources, and productive capabilities from the earth into space, at least until the threshold of extraterrestrial autocatalysis is reached, at which point a break has been achieved, and an autonomous off-planet economy *established*. Whatever the opportunities for obfuscation (which are probably considerable), the basic decision remains unaffected. The accumulation of a terrestrial fortune is not at all the same, and is in fact almost certainly economically inconsistent, with the sustained investment in an off-planet industrial infrastructure. *Either* stuff is being shifted into space, irrevocably, *or not*.

4

> Recognizing the head start obtained by the Soviets with their large rocket engines, which gives them many months of lead-time, and recognizing the likelihood that they will exploit this lead for some time to come in still more impressive successes, we nevertheless are required to make new efforts on our own. For while we cannot guarantee that we shall one day be first, we can guarantee that any failure to make this effort will make us last. We take an additional risk by making it in full view of the world, but as shown by the feat of astronaut Shepard, this very risk enhances our stature when we are successful. But this is not merely a race. Space is open to us now; and our eagerness to share its meaning is not governed by the efforts of others. We go into space because whatever mankind must undertake, free men must fully share . . . I believe that this nation should commit itself to achieving the goal, before this decade is out, of landing a man on the moon and returning him safely to the earth.[18]
>
> —John F. Kennedy

The peculiarities of the 'space race' have yet to be fully unfolded. Through its extraordinary formality, reducing extraterrestrial ambitions to a binary, international competition to put the first man on the moon, it seems—retrospectively—to owe more to the culture and history of organized sports than to technological and economic accomplishments. There would, by definition, be a winner and a loser, which is to say a Boolean decision, conventional and indisputable. Then it would be over. Perhaps it was seen to be pointing at something further, but in fact the moon was a finishing line.

Within a broad geo-strategic context, the space race was a symptom of thermonuclear stand-off. A modern history of warfare that had descended inexorably from a restrained game of princes to unleashed total war, amongst ideologically-mobilized peoples, targeting their basic institutions, industrial infrastructures, and even demographic root-stocks, had consummated itself—virtually—in the MAD potential for swift, reciprocal extermination. Under these circumstances, a regressive sublimation was called for, relaying conflict through chivalric representatives—even Homeric heroes—who competed on behalf of the super-lethal populations they appeased. The flight of an astronaut symbolized antagonism, substituting for a nuclear strike. In this sense, victory in the space race was a thinly-disguised advance payment on the conclusion of the Cold War.

This sublimation is only half of the story, however, because a double displacement took place. Whilst the space race substituted a formal (chivalric) outcome for a military result, it also marginalized the long-envisaged prospect of informal space colonization, replacing it with a predominantly conventional (or socio-political) objective. The price of unambiguous symbolic triumph was a 'triumph' that relapsed into the *real ambiguity* of (mere) symbolism, with reality-denying, postmodernist, 'moon hoax' temptations already rising. When nothing is won except winning itself, it could scarcely be otherwise. A champion is not a settler, or anything close to one.

What is this real ambiguity? It begins on the frontier, with a series of questions that reaches beyond the meaning of the space race, and into the identity of America. As a country settled within the modern

[18] John F. Kennedy, "Special Message to the Congress on Urgent National Needs."

epoch, and thus exhaustively determined by the dynamics of colonialism, America has been condensed from a frontier.

In extended parenthesis, it is worth noting explicitly that the continent's aboriginal population was not yet America, but something earlier, and other, encountered on the frontier. The idea of a 'Native American' is an exercise in historical misdirection, when it is not merely a thoughtless oxymoron. This is not to suggest that these populations were unable to *become American*, as many did, once America had begun in the modern period. By innovating distinctive modes of secession, they were even—in certain cases—able to become radically American. A reservation casino in institutional flight from the IRS is vastly more American than the Federal Reserve, in a sense that will (hopefully) become evident.

The foundation of America was a flight into the frontier, extending a trajectory of escape into a perpetually receding space, or open horizon—the future made geography, and only subsequently a political territory. This original, informal, and inherently obscure space project is as old as America itself—exactly as old. As Frederick Jackson Turner had already noted in 1893, for America an open frontier is an existential necessity, which is to say: the basic condition of American existence. Once the frontier closes, borders take over, exceptionality withers into insubstantial rhetoric (or worse, its neoconservative facsimile) and necrosis begins.

In this respect, America cannot be sustained as a state with a space program. It requires an open horizon, extended beyond the earth if necessary, sufficient to support a prolongation of its constitutive colonial process. Only on and out of this *frontier* does America have a future, although 'the USA' could (more) comfortably persist without it. That is why, beneath, alongside, and beyond the space race, the frontier 'myth' has been spontaneously extended to extraterrestrial vistas considered as *an essentially American prospect*. (NASA and its works are quite incidental to this, at best.)

Since this claim invites accusations of gratuitous controversy, it is worth re-visiting it, at a more languid pace. Even after re-emphasizing that *America* is not the same as—and is indeed almost the precise opposite of—*the USA*, obvious objections present themselves. Is not the Russian space program the world's most economically plausible? Is not the upward curve of recent Chinese space activity vastly more exuberant? Hasn't the United Nations claimed the heavens on behalf of a common humanity? What, other than cultural-historical accident, and the unwarranted arrogance stemming from it, could imaginably make 'an essentially American prospect' of outer space?

The counter-point to all of these objections is *colonialism*, understood through its radical, exceptional, American lineage. Colonialism of this ultimate variety consolidates itself from the frontier, and passes through revolutionary thresholds of a very specific type: wars of independence, or secession (rather than comprehensive regime changes) that are *pro-colonial* (rather than anti-colonial) in nature. The colony, as colony, breaks away, and in doing so creates a new society. Successful examples of such events are extremely rare—even singular, or *exceptional*. There is America, and then there are 'lost causes', with considerable (and increasing) overlap between them.

What has any of this to do with outer space, beyond impressionistic analogy? Gravity cements the connection. Dividing the surface of the earth and extraterrestrial space is an effective difference, or practical problem, that can be quite precisely quantified in technological terms (fuel to deliverable payload ratios), and summarized economically. For purposes of comparison, transporting freight across the Pacific costs US$4/kg (by air), or US$0.16/kg by ocean-bound container vessel (US$3,500 per TEU, or 21,600 kg). To lift 1 kg of cargo into Low Earth Orbit (LEO), in stark contrast, costs over US$4,000 (it was

over US$10,000 by Space Shuttle). Call it *the Rift*: an immense structural re-supply problem, incentivizing economic self-sufficiency with overwhelming force. Each kilogram of extraterrestrial product has saved US$4,000 before further calculations get started. Out in space, the Rift is the bottom line: a cold, anti-umbilical reality.

Whatever the historic colonial impetus to the *American way*—separation and social re-foundation—is reinforced by orders of magnitude in LEO and beyond. This is an environment that might have been precision-engineered for revolutionary colonialism, as science fiction writers have long recognized. On the flip side lies a more obviously explanatory conclusion: Because developments beyond the Rift are inherently uncontrollable, there is no readily discernible motivation for terrestrial political-economic agencies to fund the emergence of off-planet societies that are on an irresistible conveyor-belt to independence, whilst voraciously consuming resources, opening an avenue of escape, and ultimately laying the void foundations for a competitor civilization of a radically unprecedented, and thus ominously unpredictable kind.

It follows clearly that the *status quo* politics of space colonization are almost fully expressed by *space colonization not happening*. When understood in relation to the eclipsed undercurrent of the frontier analogy—social fission through revolutionary colonialism or wars of independence—the 'failure' of large-scale space colonization projects to emerge begins to look like something else entirely: an eminently rational determination on the part of the world's most powerful territorial states to inhibit the development of socio-technological potentials characterized by an 'American' (revolutionary colonial) tendency.

Of course, in a world that grown familiar with interchangeable anti-colonialist and anti-imperialist declarations, the terms of this analysis are initially disconcerting. When detached from the confusions and conflations of a disturbed periphery, however, the pattern is compelling. Colonists are, by their very nature, in flight from the metropolis. It is less than a single step from this acknowledgement to the recognition that they tend to independence of action, social fission, and political disintegration, following trends that imperialists—with equal inevitability—seek to curtail. Since colonization, strictly understood, is cultural and demographic transplantation, it only acquires its sense of expansion when restrained under imperial auspices. Whilst *colonial* and *rebellious* are not even close to synonymous expressions, they are nevertheless mutually attracted, in near-direct proportion to the rift that separates colony from metropolis. A colonial venture is a rebellion of the most practical and productive kind, either re-routing a rebellion from time into space, or completing itself in a rebellion that transforms an expedition into an escape. Since the triumph of imperialism over colonialism beginning in the second half of the 19th century, it is only in (and as) America that this system of relations has persisted, tenuously, and in large measure occulted by the rise of an imperial state.

It is helpful, then, to differentiate in principle (with minimal moral excitability) between a *colonial* space project, oriented to extraterrestrial settlement, and an *imperial* space program, or policy, designed to ensure terrestrial control over off-planet development, maintain political integrity, and thus secure returns on investment across the Rift. From the perspective of the territorial state, an (imperial) space program that extracted economic value from beyond earth's gravity well would be ideal, but this is an ambition unsupported by the vaguest flickerings of historical precedent (and obstructed by at least four orders of magnitude of yawning economic gulf). Second best, and quite satisfactory, is the simple prevention of colonial space projects, substituting political space theater as an expensive (but low-risk and affordable) alternative. The occasional man on the moon poses no great threat to the order of the world, so long as we "bring him safely back to earth."

America was an escape from the Old World, and this definition suffices to describe what it still is—insofar as it still is—as well as what it can be, all that it can be, and what any escape from the new old world, if accurately named, would also be. When outlined by the shadows of dark enlightenment, America is the problem that the USA was designed to solve, the door that the USA closes, the proper name for a society born from flight.

As Nietzsche never exactly said: *Am I understood? America against the stars and stripes . . .*

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